Assistant Machine Learning Engineer - Frontier Lab

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Type: Full-Time
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Category: Software Engineer/Programmer
Military

Carnegie Mellon University

What We Do

At the SEI AI Division, we conduct research in applied artificial intelligence and the engineering challenges related to building, deploying, and sustaining AI-enabled systems for high-impact government missions.

The Frontier Lab advances AI engineering and transitions frontier AI capabilities to government stakeholders through applied research, rapid prototyping, short-cycle test and evaluation, and technical advisory.

Position Summary

As an Assistant Machine Learning Engineer in the Frontier Lab, you will be a technical contributor supporting applied AI research, prototype development, and AI evaluation work for real government and DoW workflows. You will execute work in mission context-learning the users, operational constraints, and intended outcomes-so that your technical contributions are grounded in how systems are actually used. This role is well-suited for early-career engineers who enjoy building and evaluating AI/ML systems, want exposure to frontier methods, and are developing one or more areas of technical depth.

Frontier Lab work spans several complementary focus areas, including:

- Agentic AI for mission workflows (e.g., planning, analysis, decision support) where autonomous and human-guided agents interact with tools, data systems, and operators.
- AI test, evaluation, verification, and validation (TEVV) to improve confidence in performance, robustness, uncertainty, and trustworthiness of ML-enabled systems.
- Mission-tailored language models, including techniques to improve accuracy and reliability, reduce hallucinations, and integrate structured knowledge for operational tasks.

- Mission modalities and multimodal learning, including sensor fusion and learning under noisy, sparse, or constrained data conditions (including synthetic data and weakly-/self-supervised approaches).
- AI at the tactical edge, enabling capability under constrained compute/connectivity through efficient inference, compression, rapid adaptation, and update/redeploy patterns.

Key Responsibilities / Duties

Assistant MLEs are expected to be reliable technical contributors who can execute scoped work with low supervision and grow technical depth over time.

- **Mission-context execution:** Execute tasks with awareness of the operational context-users, workflows, constraints, success criteria, and outcomes-so technical decisions are relevant and defensible.
- **Technical contribution to project execution:** Implement, test, and iterate on ML capabilities, prototype systems, and evaluation tooling aligned to project goals and milestones.
- **Support applied prototyping and experimentation:** Contribute to research prototypes and experimentation workflows by implementing components, running experiments, and assisting with analysis and reporting.
- **Participate in planning and shaping tasking:** Contribute to technical discussions that shape work breakdowns and sprint plans; raise risks, dependencies, and test considerations early.
- **Iterative execution and self-management:** Execute scoped work in sprint cycles with periodic check-ins while proactively communicating status, blockers, and tradeoffs clearly.
- **Documentation and communication:** Present technical progress through demos, briefings, and concise written artifacts that enable others to build on your work.
- **Learning and growth:** Identify one or more areas of expertise to deepen over time; actively seek mentorship and learning opportunities aligned to lab priorities.
- **Community participation:** Participate in lab extracurricular activities (e.g., reading groups, internal talks, technical sharing) and contribute to a strong technical culture.

Requirements

Education / Experience:

BS in Electrical Engineering, Computer Science, Statistics, or related discipline

Technical Requirements

- Demonstrated ability to write software in Python, including working in a collaborative codebase.

- Familiarity with modern ML tools and workflows (e.g., PyTorch/TensorFlow, common data tooling, experiment tracking concepts).
- Ability to implement defined approaches, execute experiments, and contribute to evaluation and reporting.
- Ability to communicate technical results clearly and work effectively as part of a project team.
- Current or recent experience working on national security related machine learning projects within a federally funded research and development (FFRDC) environment.

Knowledge, Skills, & Abilities (KSAs)

- **Execution reliability:** Completes scoped work with quality and predictable follow-through; manages time effectively.
- **Communication:** Communicates progress, risks, and results clearly; asks good questions and seeks guidance when needed.
- **Technical learning mindset:** Learns quickly, integrates feedback, and actively develops deeper expertise in at least one area.
- **Evaluation awareness:** Understands the importance of credible evidence; contributes to test design and results interpretation.
- **Collaboration:** Works effectively with researchers and engineers; contributes constructively to discussions that shape tasking and delegation.

Desired Experience

- Coursework or applied experience in machine learning, statistics, or data-driven software systems.
- Experience implementing model training/inference, data pipelines, or evaluation tooling for CV and/or LLMs.
- Familiarity with reproducible research/software practices (version control, experiment logging, container basics).
- Experience delivering prototypes, demos, or technical artifacts for stakeholders (internal or external).
- Interest in DoW/government mission applications and working within operational constraints.

Other Requirements

- Flexible to travel to SEI offices in Pittsburgh, PA and Washington, DC / Arlington, VA, sponsor sites, conferences, and offsite meetings (~10% travel).
- You will be subject to a background investigation and must be able to obtain and maintain a Department of War security clearance.
- You must be able and willing to work onsite 5 days per week at the SEI's facility in Pittsburgh, PA.

Location

Pittsburgh, PA
Job Function

Software/Applications Development/Engineering
Position Type

Staff - Regular
Full time/Part time

Full time
Pay Basis

Salary**More Information:**

- Please visit **"Why Carnegie Mellon"** to learn more about becoming part of an institution inspiring innovations that change the world.
- Click here to view a listing of employee benefits
- **Carnegie Mellon University is an Equal Opportunity Employer/Disability/Veteran**.
- **Statement of Assurance**

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